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IS 7595-6 (1991): Fishing vessels - Otter boards, Part 6: Guidelines for selection [TED 18: Inland, Harbour Crafts and Fishing Vessels]

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भारतीय मानक

मछली पकड़ने का जलयान — उद्र पट

भाग 6 चुनाव के लिये मार्गदर्शी सिद्धान्त

Indian Standard

FISHING VESSELS — OTTER BOARDS

PART 6 GUIDELINES FOR SELECTION

UDC 639·2·081·11 : 636·96 : 599·742·4

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BUREAU OF INDIAN STANDARDS
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Price Group 1

Fishing Vessels Sectional Committee, TED 21

FOREWORD

This Indian Standard (Part 6) was adopted by the Bureau of Indian Standards, after the draft finalized by the Fishing Vessels Sectional Committee had been approved by the Transport Engineering Division Council.

Proper matching and selection of otter board with the main engine and net of a fishing trawler is of great importance. This standard (Part 6) provides guidelines for the selection of otter boards.

Other parts of the Indian standard on otter boards are as follows:

IS 7595 General requirements for otter boards:
  (Part 1) : 1975 Falt rectangular otter boards
  (Part 2) : 1976 Rectangular horizontally curved otter boards
  (Part 3) : 1977 Oval otter boards
  (Part 4) : 1986 Application standard
  (Part 5) : 1991 Vee type otter boards

Indian Standard

FISHING VESSELS — OTTER BOARDS

PART 6 GUIDELINES FOR SELECTION

1 SCOPE

1.1 This standard (Part 6) gives factors affecting the selection of otter boards and relationship between engine power and size and weight of otter boards.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
7595 (Part 4) : 1986	Fishing vessels — Otter boards : Part 4 Application standard
7595 (Part 5) : 1991	Fishing vessels — Otter boards : Part 5 Vee type otter boards

3 FACTORS AFFECTING SELECTION OF OTTER BOARDS

3.1 The following factors affect the choice of otter board types.

3.1.1 *Trawling Conditions*

For smooth and even grounds all types of otter boards are basically suitable. Rough or very rough and uneven grounds restrict the selection to certain type only. For mid-water trawling even fewer type of otter boards are suitable. Dual purpose trawling needs particularly careful consideration.

For this purpose the quality of sea-bed is divided into the following three categories:

a) Good ground, even, absence of boulders, etc.

b) Medium ground, strong, no sudden major depth changes.

c) Bad ground, large boulders, uneven, sudden and major depth variations.

3.1.2 *Hydrodynamic Efficiency*

This shall be related to operational characteristics and relative importance of these two aspects will depend mainly on prevailing fishing conditions, types and towing power of the trawlers available and the professional skill of skippers and crews. The aim shall be to achieve the highest possible hydrodynamic performance.

For the purpose main hydrodynamic, operational, technical and economic aspects of various types of otter boards given in IS 7595 (Part 4), shall be taken into consideration.

3.1.3 *Construction and Maintenance*

In commercial operations local facilities shall at least adequate for maintenance and repair, and preferably also for construction. For testing the feasibility of a specific type of otter board for local conditions, the purchase of proven prototypes is advisable, irrespective of lack of facilities which could established later.

3.1.4 *Cost*

In certain cases high cost may interfere with the rational choice of optimum operational and hydrodynamic characteristics. In this respect the long range aspects shall be carefully considered, that is, realistic expectations of better catch, lifetime of the boat, etc. Also the possible reduction of cost by local construction shall be kept in mind.

3.1.5 *Existing Experience*

The risk of failure can greatly be reduced by relying on long term experienced demonstrated by extensive use of a particular type of otter board elsewhere and by selecting a well proven design. The fact that a practical design, like the rectangular flat otter board has been used extensively since the beginning of otter trawling, does not necessarily mean that it is still the best solution available. The technical progress regarding the design of otter boards shall also be taken into consideration.

3.1.6 The final selection will be a compromise of the factors mentioned above but adequate care shall be taken to ensure that it is the best possible compromise.

4 RELATION BETWEEN ENGINE POWER AND SIZE OF OTTER BOARDS

4.1 The relation between the horse power of the engine and the area of otter board can be expressed by the following empirical formula:

$$S = 0{\cdot}094\,5\ P^{0{\cdot}58}$$

where

S is the area of otter board in m^2

P is the horse power of the engine

Figure 1 gives the graphical representation of this formula up to 600 hp and Fig. 2 gives the graphical representation above 60 hp.

4.2 Ratio between the length and width of the otter board is usually 2 : 1 approximately. If B denotes the width of an otter board, the length

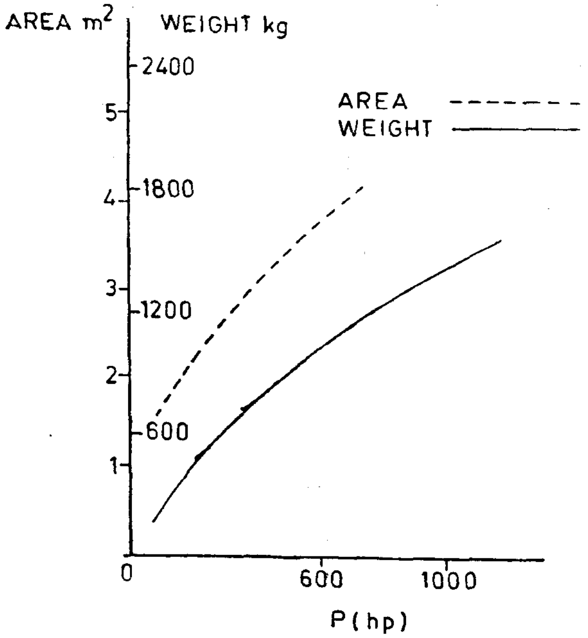

FIG. 1 TYPICAL RELATION BETWEEN HORSE POWER OF (BELOW 600) MAIN ENGINE P (hp) AND WEIGHT AND AREA

will be 2*B*. Then *B* can be calculated by means of the following formula:

$$B = \sqrt{\frac{0{\cdot}094\,5\,P^{0{\cdot}58}}{2}}$$

4.3 The practice of towing an otter board with a non-optimum angle of attack is a clear waste of towing power which has to be compensated by larger main engines. For most smaller trawlers. where towing power is the main limiting factor for the type and size of trawl gear and towing speed, it is worthwhile to aim at optimum efficiency of the otter boards. For this purpose, reference shall be made to IS 7595 (Part 4).

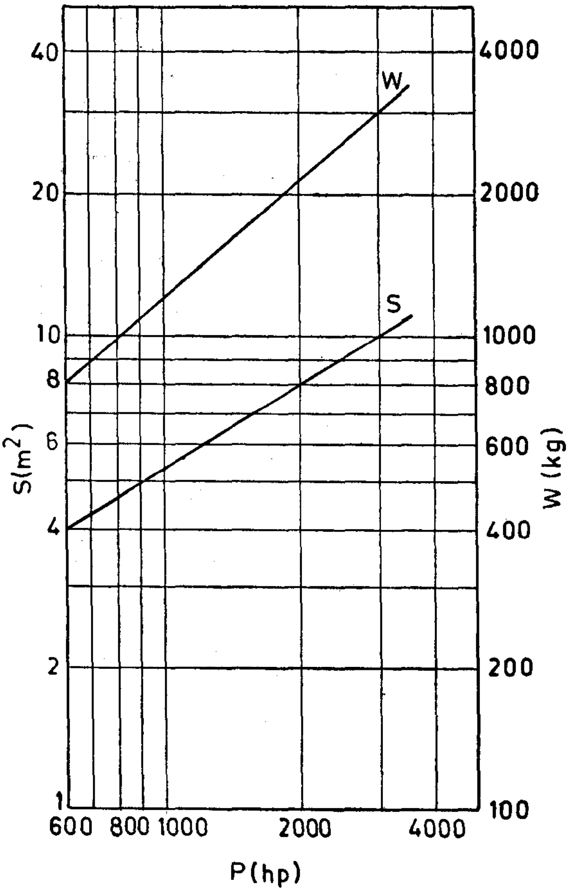

FIG. 2 RELATION BETWEEN HORSE POWER OF (ABOVE 600) MAIN ENGINE P (hp) *versus* WEIGHT (W) AND AREA (S)

5 RELATION BETWEEN ENGINE POWER AND WEIGHT OF THE OTTER BOARD

5.1 The weight of the otter board is proportional to the horse power of the engine and is shown graphically on logarithmic paper in Fig. 1.

From Fig. 2 the weight of the otter board in relation to the engine power can be expressed by the following empirical formula:

$$W = 0{\cdot}004\,78\,P^{0{\cdot}8} \times 1\,000$$

where

W is the weight of the otter board in kg; and

P is the horse power of the engine.

The weight of the otter board for engine power up to 600 hp is given Fig. 1.

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